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FOR IMMEDIATE RELEASE
Dec. 14, 2006

NEW OCEAN INDEX TOOL FORECASTS NORTHWEST SALMON RETURNS

Using a new predictive tool to monitor the oceanographic and biological conditions of the Northern California Current, scientists with the National Oceanic and Atmospheric Administration's Fisheries Service (NOAA Fisheries) said today that ocean conditions this year are about average for juvenile salmon entering the Pacific Ocean and vastly improved over the poor conditions observed in 2005, which should be good for adult salmon returns to Pacific Northwest rivers over the next two years.

Scientists at the agency's Northwest Fisheries Science Center in Seattle have discovered many critical links between physical conditions in the ocean and how the biological communities within the coastal ecosystem respond to those conditions.

"We can now use this information to better understand what's going on in our coastal ocean, provide better forecasts of salmon returns and help reduce the uncertainty surrounding why salmon return rates vary so much from year to year," said Dr. Usha Varanasi, science and research director at the Science Center.

Since 1997 scientists at the Center have been monitoring the coastal ocean environment off Washington and Oregon, including the Columbia River where it empties into the Pacific, its interaction with the California Current, and how it affects the abundance, growth, distribution and survival of juvenile salmon.

The California Current, a body of cold water that flows south from British Columbia to southern Baja California, can drag even colder water from the subarctic domain to the Pacific Northwest coast. This water can be supplemented with deep, nutrient-rich water brought to the surface along the coast in a process called upwelling.

The Science Center's information was used to develop an ocean index to assess ocean conditions of the Northern California Current ecosystem, and to predict changes in adult salmon populations from the Columbia River basin and coho salmon from the Oregon coast.

The ocean index uses physical and biological measurements to forecast how juvenile salmon respond to changes in the ocean. Physical indicators include sea-surface temperature, salinity, local upwelling strength and duration influenced by large-scale atmospheric conditions over the north and equatorial Pacific Ocean (such as El Niño). Biological indicators include the abundance and diversity of copepods, the microscopic animals that form the foundation of the salmon's food chain; the abundance of salmon predators and the small fish salmon prey upon; and estimates of juvenile salmon abundance collected during trawl surveys.

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This year the physical oceanographic indicators showed moderately strong upwelling and an early spring transition, and cooler sea-surface temperatures.

"We're excited that several years of research have yielded a tool we think will significantly improve our ability to forecast salmon runs in the Northwest" said John Ferguson, director of the Science Center's fish ecology division. "Early this year we observed a lot of upwelling, which indicates in general that we'd expect higher salmon returns compared to recent years."

Ferguson added, however, that scientists also observed a period of poor upwelling and warm ocean conditions from mid-May to mid-June, a critical time when salmon have just entered the ocean. While the number of juvenile Chinook salmon captured during June sampling indicated good adult returns in the future, Ferguson said sampling in September produced very low numbers of juvenile coho that in turn suggest poor adult returns of coho.

"So the ocean is sending us mixed signals this year" he said.

A full assessment of expected returns will be developed once all of the physical and biological ocean indicators for this year have been evaluated. Scientists at the Center will post the status of the dynamic coastal marine environment off Washington and Oregon through a continuously updated website starting in January 2007 and in an annual report.

Regional fishery managers are looking forward to this new scientific tool because it will provide leading indicators that forecast adult salmon return rates up to one year in advance for coho and up to two years in advance for Chinook, and will help them make more informed decisions.

The Northwest Fisheries Science Center conducts research to help conserve and manage living marine resources and their habitats in the Northeast Pacific Ocean. The Center's research assists resource managers in making sound decisions that build sustainable fisheries, recover endangered and threatened species, sustain healthy ecosystems and reduce human health risks. The Center is particularly active in the Puget Sound region and is currently working to advance scientific efforts that inform policy decisions affecting recovery of salmon and killer whales in Puget Sound.

In 2007 the NOAA, an agency of the U.S. Commerce Department, celebrates 200 years of science and service to the nation. From the establishment of the Survey of the Coast in 1807 by Thomas Jefferson to the formation of the Weather Bureau and the Bureau of Commercial Fisheries in the 1870s, much of America's scientific heritage is rooted in NOAA.

On the Web:

NOAA: <http://www.noaa.gov>

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